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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/934,817	08/21/2001	Christian Wagner	(Z) 98003 P US	9363

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EXAMINER

LEROUX, ETIENNE PIERRE

ART UNIT	PAPER NUMBER
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2161

DATE MAILED: 11/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/934,817

Applicant(s)

WAGNER ET AL.

Examiner

Etienne P. LeRoux

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 and 39-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-36 and 39-41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 8/21/2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Prosecution Reopened


In view of the Appeal Brief filed on July 16, 2004, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:


SAFET METJAHIC
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 210

Claim Status

Claims 1-36 and 39-41 are pending. Claims 37, 38 and 42-44 have been cancelled.
Claims 1-36 and 39-41 are rejected as detailed below.

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Provisional Double Patenting

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

Claims 1-36 and 39-41 of this application conflict with claims 1-36 and 39-41 of Application No. 10/826,823. 37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. Applicant is required to either cancel the conflicting claims from all but one application or maintain a clear line of demarcation between the applications. See MPEP § 822.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-36 and 39-41 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

To satisfy section 101 requirements, the claim must be for a practical application which can be identified as below:

- 1) The claimed invention 'transforms' an article or physical object to a different state or thing
- 2) The claimed invention should produce a useful, concrete and tangible result.

The claimed invention should produce a transformation or reduction of an article to a different state or thing. Arguably, this requirement is met because of the claimed shape of the heat supply relative to shape of an optical element represents a different state compared to shape of the heat supply that would be obtained when heat flow is not subject to the claimed apparatus.

The claimed invention should be a practical application. In particular, the claimed invention should produce a result that is 'useful, tangible and concrete' in the claimed field of optical systems. The present invention is not useful because a heat supply of a particular shape is not claimed. Applicant employs negative language to claim an undetermined number of shapes of the heat supply. The usefulness of an undetermined number of shapes of the heat supply would not be obvious to one of ordinary skill in the art in the highly developed and precise field of optics.

The invention must produce a concrete result. A question arises when a result cannot be assured. In other words, the process must have a result that can be substantially repeatable or the process must substantially produce the same result again. In re Swartz, 232 F.3d 862, 864, 56 USPQ2d 1703, 1704 (Fed. Cir. 2000). The opposite of concrete is unrepeatable or unpredictable. The claimed invention is unrepeatable because it depends on a plurality of different shapes of an optical element. Furthermore, the type of optical element is unclear. It could be any one of a plurality of different types of optical elements such as a lens, liquid crystal, prism, light

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synthesizer, light retarder, etc. Applicant uses negative language to claim an undetermined number of shapes of the heat supply. The combination of one or more of the above factors causes the claimed invention to be unrepeatable by one of ordinary skill in the art.

The claimed invention must produce a tangible result. Heat transfer is subject to the law(s) of nature, which are not patentable. However, the present invention claims an apparatus which attempts to regulate heat transfer and consequently is an application of a law of nature and is eligible for patent protection. *Diehr*, 450 U.S. at 187, 209 USPQ at 8 (emphasis added).

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-36 and 39-41 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 1 recites “a connecting structure between said mount and said optical element having a symmetry characteristic that substantially does not corresponds to the shape of the optical element.” One of ordinary skill in the art would not be able to make and use the invention without undue experimentation because the specification does not include a clear and concise description of the manner and process of making a connecting structure which has a symmetric characteristic that does not correspond to the shape of the optical element. Undue

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experimentation would be required because the skilled artisan would have to experiment with many different connecting structures because there are many situations where the symmetry characteristic of the cooling structure does not correspond, in some undefined way, to the optical element.

Claim 1 recites “a connecting structure between said mount and said optical element having a symmetry characteristic that substantially does not corresponds to the shape of the optical element.” The specification does not reasonable convey to the skilled artisan that the applicant was in possession of the claimed invention as of the date of the invention because the specification does not explain the shape of the connecting structure, the size of the connecting structure, specific details of the composition of the material employed in the connecting structure, the means of securing the connecting structure to the optical element, the means of securing the connecting structure to the mount.

Claim 1 recites “a connecting structure between said mount and said optical element having a symmetry characteristic that substantially does not corresponds to the shape of the optical element.” The specification does not describe in clear and concise terms the best mode of carrying out the invention. Paragraph 27 states there are numerous webs, such as eight, paragraph 32 mentions four webs with different cross-sections, paragraph 32 mentions in actual practice there are more than four webs but does not explicitly say how many, paragraph 35 mentions there can be additional thermal cooling elements in order to equalize cooling and paragraph 36 includes any other mounting technique (i.e., connecting structure) is likewise usable.

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Claim 1 recites “wherein said optical element is acted on by said radiation such that a heat supply results from said radiation that lacks symmetry corresponding to the shape of the optical element.” One of ordinary skill in the art would require undue experimentation to reproduce the claimed invention because the shape of the optical element is not defined nor is the shape of the heat supply specifically claimed. Furthermore, applicant uses a negative limitation and thus there are a plurality of shapes of a heat supply which will meet the condition required by the claim limitation. One of ordinary skill in the art would not be able to reproduce the present invention without undue experimentation.

Claims 2, 3, 4 and 36 are rejected for reasons similar to claim 1.

Claims 5-35 and 39-41 are rejected for being dependent from a rejected base claim.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-36 and 39-41 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites “a connecting structure between said mount and said optical element having a symmetry characteristic that substantially does not corresponds to the shape of the optical element.” The metes and bounds of the present invention cannot be determined because applicant employs a negative limitation and does not particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites “a connecting structure between said mount and said optical element having a symmetry characteristic that substantially does not corresponds to the shape of the optical element.” Applicant claims “a connecting structure between said mount and said optical element having a symmetry characteristic that substantially does not correspond to the shape of the optical element.” The above claim limitation does not set forth subject matter which applicant regards as the invention. Paragraph 21 of the specification states “Fig. 5a shows an FEM model with symmetrically arranged like cooling bodies.” Figures 1 and 2 also show symmetrically arranged cooling bodies. Regarding Figure 3a, there are at least two clear lines of symmetry. It is unclear to what the symmetry characteristic of the connecting structure does not correspond.

Claim 1 recites “a connecting structure between said mount and said optical element having a symmetry characteristic that substantially does not corresponds to the shape of the optical element.” The above claim limitation does not particularly point out and distinctly claim the invention because it is unclear how symmetric characteristic corresponds to shape. Shape implies the complete overall spatial dimensions of a body while symmetry characteristic is a single line or infinite plane about which a body has a corresponding shape or outline.

Claim 1 recites “wherein said optical element is acted on by said radiation such that a heat supply results from said radiation that lacks symmetry corresponding to the shape of the optical element.” The metes and bounds of the present invention cannot be determined because it is difficult to determine how the shape of the heat supply corresponds, or does not correspond, to the shape of the optical element. Applicant employs negative claim language and thus does not particularly point out and distinctly claim the subject matter which applicant regards as the

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invention. Furthermore, reference to applicant's Figures 1, 2, 3a and 6 shows at least one line of symmetry between the optical element and the shape of the heat supply.

Claims 2, 3, 4 and 36 are rejected for reasons similar to claim 1.

Claims 5-35 and 39-41 are rejected for being dependent from a rejected base claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 and 36 and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by US Pat No 4,739,396 issued to Hyatt.

Claims 1, 36 and 37:

Hyatt discloses:

a light source that emits radiation [light source 1634, Fig 16F],

a mount [case 1632, Fig 16F],

an optical element [LCD 1610, Fig 16F] fastened in said mount, wherein said optical element is acted on by said radiation such that a heat supply results from said radiation that lacks symmetry corresponding to the shape of said optical element [Fig 16D, col 54, line 36 – col 55, line 40, fins of heat-sink in Fig 16E causes unsymmetrical heat distribution]

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a connecting structure [conductive device 1624, Fig 16D and Fig 16E] between said mount [case 1632, Fig 16F] and said optical element [LCD 1610, Fig 16F] having a symmetry characteristic that substantially does not correspond to the shape of the optical element [claim limitation interpreted per applicant's Figures 1 and 2 which shows symmetry]

Notes:

1. The limitation "such that a heat supply results from said radiation that lacks symmetry" is merely functional language in the middle of an apparatus claim and thus will not be given patentable weight. Per MPEP § 2106, above limitation is language that suggests but does not require steps to be performed or does not limit a claim to a particular structure. Such language is drawn to intended use or field of use and is not given patentable weight.

2. However, even if "such that a heat supply results from said radiation that lacks symmetry" is considered to be patentable, then Hyatt's column 55, lines 1-20 describes how heat is conducted away from LCD 1610 in Fig 16D by a heat conductive device 1624 between LCD 1610 and the case 1632. Column 55, lines 23-30 describes a heat conductive device that has fins 1626 for heat transfer, such as shown in Fig 16E. A heat transfer device with fins at the back of optical device 1610 obviously will cause unsymmetrical heat supply to exist on the optical device 1610.

Claims 2, 3, 7-10, 18, 19, 22, 23, 27-31 and 41 are rejected under 35 U.S.C. 102(e) as being anticipated by US Pat No 5,805,273 issued to Unno.

Claim 2:

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Unno discloses a light source [Fig 1, 2] that emits radiation, an optical element [Fig 2, 41] fastened in said mount, wherein said optical element is acted on by said radiation such that heat that results from said radiation lacks symmetry [Fig 2, 42] corresponding to the shape of said optical element [col 8, lines 20-28], and a single or multi-part thermally conducting element arranged in operative connection with said optical element and said mount and having a form of heat transport that effects an at least partial compensation of the asymmetry of temperature distribution in said optical element [Fig 2, 14]

Claim 3:

Unno discloses an optical element that is heated by radiation in a manner that lacks rotational symmetry [Fig 2, 42], and a cooling system for said optical elements that lacks rotational symmetry [Fig 9, 13' and 14'], said cooling system including passive thermally conducting elements that effect cooling, in which said thermally conducting elements comprise adjustable portions [col 9, lines 44-55]

Claim 7:

Unno discloses the optical element comprises a transmitting element [Unno, lens 41, Fig 2, col 8, lines 9-14].

Claim 8:

Unno discloses the transmitting element comprises a lens [Unno, lens 41, Fig 2, col 8, lines 9-14]

Claim 9:

Unno discloses the optical element comprises a transmitting element [Unno, lens 41, Fig 2, col 8, lines 9-14].

Claim 10:

Unno discloses the transmitting element comprises a lens [Unno, lens 41, Fig 2, col 8, lines 9-14]

Claim 18:

Unno discloses a slit-shaped image field [Fig 1, 7]

Claim 19:

Unno discloses a slit-shaped image field [Fig 1, 7]

Claim 22:

Unno discloses the optical element is arranged near a field plane [Fig 1, W].

Claim 23:

Unno discloses the optical element is arranged near a field plane [Fig 1, W].

Claim 27:

Unno discloses a reticle, the illumination of which lacks rotational symmetry [Fig 1, 8]

Claim 28:

Unno discloses the reticle illumination consists of off-axis, dipole or quadrupole illumination type [col 5, lines 24-27]

Claim 29:

Unno discloses a reticle, the illumination of which lacks rotational symmetry [Fig 1, 8]

Claim 30:

Unno discloses the reticle illumination consists of off-axis, dipole or quadrupole illumination type [col 5, lines 24-27]

Claim 31:

Unno discloses the optical element is arranged near a pupil plane [Fig 1, 3]

Claim 41:

Unno discloses the thermally conducting elements comprise adjustable portions [Fig 1]

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 5, 6, 17, 21, 25, 26 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Pat No 5,805,273 issued to Unno (hereafter Unno) in view of US Pat No 5,883,704 issued to Nishi et al (hereafter Nishi).

Claim 1:

Unno discloses a light source [Fig 1, 2] that emits radiation, an optical element [Fig 2, 41] fastened in said mount, wherein said optical element [Fig 2, 41] is acted on by said radiation such that a heat supply results from said radiation that lacks symmetry [Fig 2, 42] corresponding to the shape of said optical element [col 8, lines 20-28], a slit-shaped image field [Fig 1, 7], said optical element is arranged near a field plane [Fig 1, W].

Unno discloses above essential elements of the claimed invention as noted above but is silent regarding a connecting structure between said optical element and said mount having a symmetry characteristic that does not correspond to the shape of the optical element. Nishi

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discloses a connecting structure between said optical element and said mount having a symmetry characteristic that does not correspond to the shape of the optical element [Fig 2, G1, G2]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Unno to include a connecting structure between said optical element and said mount having a symmetry characteristic that does not correspond to the shape of the optical element as taught by Nishi for the purpose of securing lens elements to the lens barrel to create a projection optical system [col 11, lines 23-24 and col 11 , lines 33-39].

Claim 5:

The combination of Unno and Nishi discloses the elements of claim 1 as noted above and furthermore discloses the optical element comprises a transmitting element [Unno, lens 41, Fig 2, col 8, lines 9-14]

Claim 6:

The combination of Unno and Nishi discloses the elements of claims 1 and 5 as noted above and furthermore discloses the transmitting element comprises a lens [Unno, lens 41, Fig 2, col 8, lines 9-14]

Claim 17:

The combination of Unno and Nishi and furthermore discloses a slit-shaped image field [Unno, Fig 1, 7]

Claim 21:

The combination of Unno and Nishi discloses the elements of claims 1 and 5 as noted above and furthermore discloses the optical element is arranged near a field plane [Fig 1,W]

Claim 25:

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The combination of Unno and Nishi discloses the elements of claim 1 as noted above and furthermore discloses a reticle, the illumination of which lacks rotational symmetry [Fig 1, 8]

Claim 26:

The combination of Unno and Nishi discloses the elements of claims 1 and 25 as noted above and furthermore discloses the reticle illumination consists of off-axis, dipole or quadrupole illumination [col 5, lines 24-27].

Claim 39:

The combination of Unno and Nishi discloses the connecting structure comprises adjustable portions [Unno, Fig 1].

Claims 4, 11, 12, 20, 24 and 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Unno in view of US Pat No 5,313,333 issued to O'Brien et al (hereafter O'Brien).

Claim 4:

Unno discloses comprising an optical element [Fig 2, 41] that is heated by radiation in a manner that lacks rotational symmetry [Fig 2], at least one passively thermally conducting part arranged in thermal contact with said optical element, which part covers a portion of the cross section of said optical element which is not exposed to said radiation, and which part reduces temperature gradients in said optical element [Fig 9, 13' and 14']

Unno discloses the elements of the claimed invention as noted above but is silent regarding at least one passive thermally conducting part of a thermal conductor in thermal contact with said optical element comprises a plurality of different materials and in which said at

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least one passive thermally conducting part of a thermal conductor in thermal contact with said optical element is at least partially adjustable. O'Brien discloses at least one passive thermally conducting part of a thermal conductor in thermal contact with said optical element comprises a plurality of different materials and in which said at least one passive thermally conducting part of a thermal conductor in thermal contact with said optical element is at least partially adjustable [Fig 1, 24, 26, 30, 44 and col 3, lines 10-43]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Unno to include at least one passive thermally conducting part of a thermal conductor in thermal contact with said optical element comprises a plurality of different materials and in which said at least one passive thermally conducting part of a thermal conductor in thermal contact with said optical element is at least partially adjustable as taught by O'Brien for the purpose of compensating for thermal shifts in system focal length while maintaining radial and angular alignment of the lens relative to the laser diode source [abstract].

Claim 11:

Unno discloses the optical element comprises a transmitting element [Unno, lens 41, Fig 2, col 8, lines 9-14].

Claim 12:

Unno discloses the transmitting element comprises a lens [Unno, lens 41, Fig 2, col 8, lines 9-14]

Claim 20:

Unno discloses a slit-shaped image field [Fig 1, 7]

Claim 24:

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Unno discloses the optical element is arranged near a field plane [Fig 1, W].

Claim 32:

Unno discloses a reticle, the illumination of which lacks rotational symmetry [Fig 1, 8]

Claim 33:

The combination of Unno and Nishi discloses the elements of claim 32 as noted above and furthermore discloses the reticle illumination consists of off-axis, dipole or quadrupole illumination [col 5, lines 24-27].

Claim 34:

Unno discloses the optical element is arranged near a pupil plane [Fig 1, 3]

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Unno and Nishi and further in view of US Pat No 3,626,176 issued to Tsugami (hereafter Tsugami).

Claim 13:

The combination of Unno and Nishi discloses the elements of claim 1 as noted above but is silent regarding the optical element comprises a mirror. Tsugami discloses the optical element comprises a mirror [abstract]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above combination of references to include the optical element comprises a mirror as taught by Tsugami for the purpose of creating a reflective device [abstract].

Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Unno in view of Tsugami.

Claim 14:

Unno discloses the elements of claim 2 as noted above but is silent regarding the optical element comprises a mirror. Tsugami discloses the optical element comprises a mirror [abstract]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Unno to include the optical element comprises a mirror as taught by Tsugami for the purpose of creating a reflective device [abstract].

Claim 15:

Unno discloses the elements of claim 3 as noted above but is silent regarding the optical element comprises a mirror. Tsugami discloses the optical element comprises a mirror [abstract]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Unno to include the optical element comprises a mirror as taught by Tsugami for the purpose of creating a reflective device [abstract].

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Unno and O'Brien and further in view of Tsugami.

Claim 16:

The combination of Unno and O'Brien discloses the elements of claim 4 as noted above but is silent regarding the optical element comprises a mirror. Tsugami discloses the optical element comprises a mirror [abstract]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above combination of references to include

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the optical element comprises a mirror as taught by Tsugami for the purpose of creating a reflective device [abstract].

Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Unno and Nishi and further in view of O'Brien.

Claim 35:

The combination of Unno and Nishi discloses the elements of claim 1 as noted above but is silent regarding the connecting structure comprises different materials. O'Brien discloses the connecting structure comprises different materials [Fig 1, 24, 26, 30, 44 and col 3, lines 10-43]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above combination of references to include the connecting structure comprises different materials as taught by O'Brien for the purpose of compensating for thermal shifts in system focal length while maintaining radial and angular alignment of the lens relative to the laser diode source [abstract].

Claims 36 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Unno in view of O'Brien.

Claim 36:

Unno discloses a light source [Fig 1, 2] that emits radiation, an optical element [Fig 2, 41] fastened in said mount, wherein said optical element is acted on by said radiation such that heat that results from said radiation lacks symmetry [Fig 2, 42] corresponding to the shape of said optical element [col 8, lines 20-28], and a single or multi-part thermally conducting element

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arranged in operative connection with said optical element and said mount and having a form of heat transport that effects an at least partial compensation of the asymmetry of temperature distribution in said optical element [Fig 2, 14]

Unno discloses the elements of the claimed invention as noted above but is silent regarding wherein said passively thermally conducting element comprises an assembly of portions of different material. O'Brien discloses wherein said passively thermally conducting element comprises an assembly of portions of different material [Fig 1, 24, 26, 30, 44 and col 3, lines 10-43]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Unno to include wherein said passively thermally conducting element comprises an assembly of portions of different material as taught by O'Brien for the purpose of compensating for thermal shifts in system focal length while maintaining radial and angular alignment of the lens relative to the laser diode source [abstract].

Claim 40:

The combination of Unno and O'Brien discloses the elements of claim 2 as noted above and furthermore, discloses the thermally conducting element is adjustable [O'Brien, Fig 1, 24, 26, 30, 44 and col 3, lines 10-43]

Response to Arguments

Applicant's arguments filed in Appeal Brief of July 16, 2004 have been fully considered but they are not persuasive.

Applicant Argues:

Applicant states in the third paragraph of page 3 “Hyatt neither shows nor describes the claimed feature of a connecting structure between the optical element and the mount having a symmetry characteristic that substantially does not correspond to the shape of the optical element but just the opposite.”

Examiner Responds:

Examiner is not persuaded. MPEP Section 2106 requires office personnel to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Claims must be interpreted in view of the specification without importing limitations from the specification into the claims. Applicant states in the first paragraph of page 2 of Appeal Brief filed July 16, 2004 that Figures 1 and 2 provide antecedent basis for at least, claim 1. Considering Figures 1 and 2, it is not immediately apparent how the connecting structure has a symmetry that substantially does not correspond to the shape of the optical element. In fact, Figure 1 shows eight supporting webs (21-28) symmetrically arranged around the circumference of the lens body 2. Figure 2 shows four webs (211-214) symmetrically arranged between lens 1 and lens mount 2. Paragraphs 27-36 of the specification provide further details regarding Figures 1 and 2. However, paragraphs 27-36 provide no support for the claim language “a connecting structure between said mount and said optical element having a symmetry characteristic that substantially does not correspond to the shape of the optical element.” Applicant does not even mention “symmetrical characteristic” in paragraphs 27-36 of the specification. One of ordinary skill in the art would not be able to determine how in fact the symmetry of the connecting structure does not correspond to the shape of the optical element. One of ordinary skill in the art would even be more confused by

paragraph 36 which includes “Any other mounting technique is likewise usable.” Due to applicant’s failure to provide sufficient supporting disclosure in the drawings and the specification, such that above claim limitation can be accurately interpreted, examiner will give above claim limitation its broadest reasonable interpretation.

A common dictionary¹ defines symmetry as “similarity of form or arrangement on either side of a dividing line or plane.” Furthermore, the same dictionary defines shape as “that quality of a thing which depends on the relative position of all points composing its outline or external surface, physical or spatial form.” One of ordinary skill in the art would not be able to relate “symmetry characteristic” to shape because they are completely different concepts. Shape implies the complete overall spatial dimensions of a body while “symmetry characteristic” is a single line or infinite plane about which a body has a corresponding shape or outline. It is not reasonable to equate a physical body to a line.

Hyatt discloses in Figure 16 a typical arrangement of a projection apparatus comprising cooling functions. Figure 16D shows a connecting structure (conductive device 1624) mounted on an optical element (LCD 1610). Connecting structure (conductive device 1624, col 53, line 57-col 54, line 55) may be used to support optical element (LCD 1610) to a mount (case 1623, Fig 16F). Examiner interprets the claim limitation to mean the symmetry characteristic of the connecting structure (Fig 16D, 1624) on optical element (LCD 1610) corresponds to the symmetry characteristic of the optical element (LCD 1610).

Applicant Argues:

¹ Webster’s New World College Dictionary, Fourth Edition

Applicant states in the fourth paragraph on page 4 “The radiation that lacks symmetry” feature is connected to Fig 13 without any reasoning why Fig 13 would be related to this feature or to its context, or to Figs 16.”

Examiner Responds:

Examiner is not persuaded. Examiner maintains above comment is unclear because applicant did not include the inventor related to Figure 13.

Nevertheless, examiner will consider the claim limitation “wherein said optical element is acted on by said radiation such that a heat supply results from said radiation that lacks symmetry corresponding to the shape of said optical element” with reference to Hyatt.

MPEP Section 2106 requires office personnel to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Claims must be interpreted in view of the specification without importing limitations from the specification into the claims. Considering Figures 1 and 2 of the present application, it is obvious that slit-shaped cross section 10 in Figure 1 is symmetrical with respect to the shape of the optical element. Furthermore, paragraph 34 of the specification of the present application states:

[0034] Additionally, a "dipole" illumination of the lens with two eccentric light spots 101, 102 is shown in this FIG. 2, as occurs in the region of the diaphragm plane and equivalent planes of projection exposure systems with **symmetrical** oblique illumination. Astigmatic errors due to light absorption also arise therewith, and can be reduced by passive compensating cooling.

Above paragraph 34 states that the illumination is symmetrical which is exactly opposite to the claim language which claims “wherein said optical element is acted on by said radiation such that a heat supply results from said radiation that lacks symmetry corresponding to the

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shape of said optical element.” One of ordinary skill in the art would be confused by the lack of support in the disclosure for applicant’s statement “the radiation that lacks symmetry” As best examiner is able to ascertain, the following disclosure by Hyatt reads on “The radiation that lacks symmetry”

Hyatt in column 55, lines 1-20 describes how heat is conducted away from LCD 1610 in Fig 16D by a heat conductive device 1624 between LCD 1610 and the case 1632. Column 55, lines 23-30 describes a heat conductive device that has fins 1626 for heat transfer, such as shown in Fig 16E. A heat transfer device with fins at the back of optical device 1610 obviously will cause unsymmetrical heat supply to exist on the optical device 1610.

Applicant Argues:

Applicant states on page 4 “The description of Fig. 13, col. 6, lines 26-28 clearly states that is shows electro-optical elements, not any radiation.”

Examiner Responds:

Examiner is not persuaded. Examiner did not reference above disclosure of Hyatt. Figure 13 of Hyatt is drawn to an embodiment of Hyatt’s disclosure that was not relied upon to reject the limitation “wherein said optical element is acted on by said radiation such that a heat supply results from said radiation.”

However, examiner considers below the production of heat as a result of illumination, i.e., a form of electromagnetic radiation, acting upon an optical element. Examiner maintains that illumination is part of the electromagnetic spectrum by which energy is radiated or transmitted.

The following is taken from Wikipedia – the on-line encyclopedia.

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Generally, electromagnetic radiation (EM) radiation is classified by wavelength into electrical energy, radio, microwave, infrared, the visible region we perceive as light, ultraviolet, X-rays and gamma rays. EM radiation with a wavelength between 400 nm and 700 nm is detected by the human eye and perceived as visible light. If radiation having a frequency in the visible region of the EM spectrum shines on an object, say a bowl of fruit, this results in our visual perception identifying information from the scene.

Furthermore, Hyatt discloses in column 71 lines 35-40 the following:

Illumination is herein intended to be interpreted in broad form and is intended to mean generalized illumination including light, both visible and non-visible, electron beams, generalized electromagnetic radiation including microwaves, and other forms of illumination

Examiner maintains that the disclosure of Hyatt and any other references cited by examiner clearly reads on the claim language “wherein said optical element is acted on by said radiation such that a heat supply results from said radiation.”

Applicant Argues:

Applicant states in the fifth paragraph on page 4 “Claims 1-12, 17-35, 43 and 44 are rejected under 35 USC 103 as being unpatentable over Unno in view of Nishi. Nishi in no way addresses cooling of lenses. And Unno is diametrical to the idea of passive compensation and hence gives no suggestion at all for a combination with Nishi.”

Examiner Responds:

Examiner is not persuaded. Applicant is directed to the title of the Nishi reference which reads “Projection exposure apparatus wherein focusing of the apparatus is changed by controlling the temperature of a lens element of the projection optical system.”

Furthermore, MPEP Section 2106 requires office personnel to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Claims must be interpreted in view of the

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specification without importing limitations from the specification into the claims. The specification of instant application does not particularly define “passive compensation” and thus examiner will give above terminology its broadest reasonable interpretation, such as natural cooling. Unno discloses natural cooling in column 7, lines 64-66.

Furthermore, In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The Nishi reference, as can be seen from above Office Action is relied upon for details of a connecting structure between the mount and the optical element. In above office action, it is noted that the Unno reference is silent regarding the physical details of a connecting structure between the mount and the optical element. However, Nishi discloses physical details of a connecting structure between a lens and a securing means such as a lens barrel. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Unno to include a “connecting structure between said mount and said optical element” for the purpose of creating a projection optical system.

Applicant Argues:

Applicant states on page 6 “Unno and Nishi do not motivate or suggest to a person skilled in the art to combine these references to duplicate the claims of the present invention.

Examiner Responds:

Examiner is not persuaded. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be

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established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, examiner maintains that the suggestion to combine the references would have been available to one of ordinary skill in the art at the time the invention was made for the reasons given below.

Unno discloses in column 6, lines 12-23, the following:

The projection lens 9 of this embodiment is equipped with temperature controlling devices 13 and 14 which are disposed at peripheral portions of the lens. These temperature controlling devices 13 and 14 cooperate with control means 15 (to be described later) to adjust the inside temperature distribution in a lens or lenses of the projection lens 9. The stage 10 is provided with a focus adjusting device 16 which is operable in response to a signal from the control means 15 to adjust the level or height of the wafer surface relative to a change in focus position (i.e., focus error) of the projection lens 9.

Unno discloses in Field of the Invention and Related Art, column 1, lines 35-43, the following:

Usually, when the transfer of a fine circuit pattern is performed by use of a stepper having a projection optical system, a lens or lenses constituting the projection optical system absorb a portion of ultraviolet light used for the exposure process. Thus, the lens or lenses may thermally expand to cause a change in the surface shape thereof, or the temperature distribution within the lens may become non-uniform to cause a non-uniform refractive index distribution within the lens. This leads to a change in imaging characteristic of the projection optical system.

Nishi discloses the following in column 2, lines 43-55:

To solve the above problems, it is considered that a temperature of at least one lens element of the projection optical system is adjusted. When the lens element is heated or cooled to achieve a target temperature of the lens element, a predetermined time period is elapsed until the target

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temperature of the lens element is obtained. Accordingly, if the exposure is started before such time period is elapsed, the exposure will be effected before the imaging characteristic of the lens element is corrected. A further object of the present invention is to provide a projection exposure apparatus in which the exposure is effected after predetermined temperature adjustment is completed.

Obviously, Unno and Nishi are both concerned with temperature distortion in lenses of a projection apparatus and thus it would have been obvious to one of ordinary skill in the art to combine elements of the teaching of Unno with elements of the teaching of Nishi in order to produce an improved method of controlling the distortion in a projection apparatus, the distortion being caused by non-uniform temperature distribution in the lenses. Since both Unno and Nishi are concerned with solving the problem of ensuring good projection when heat in the system may distort system components such a lens, it would have been obvious to one of ordinary skill in the art to combine the teachings of Unno and Nishi for a very well-known feature of a projection system i.e., the mounting of a lens.

Applicant Argues:

Applicant argues on page 6 that “Unno and Nishi do not motivate to a person skilled in the art to combine these references to duplicate the claims of the present invention.

Examiner Responds:

Examiner is not persuaded. Applicant is referred to above response by examiner.

Applicant Argues:

Applicant states on page 6 “In Figure 2 of Nishi, reference numerals G1, G2 are described at column 11, line 22 to column 12, line 22. G1, G2 are identified as lens frames and nothing is said about their geometry. Only column 11, line 39, provides information concerning

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their geometry: 'a gas chamber enclosed by the lens elements 33, 34 and the lens frame G1 is sealed

Examiner Responds:

Examiner is not persuaded. It is necessary to consider the claim language which is relevant to above comment by applicant. i.e., "a connecting structure between said mount and said optical element having a symmetry characteristic that substantially does not correspond to the shape of the optical element."

Examiner is not persuaded. MPEP Section 2106 requires office personnel to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Claims must be interpreted in view of the specification without importing limitations from the specification into the claims. Applicant states in the first paragraph of page 2 of Appeal Brief filed July 16, 2004 that Figures 1 and 2 provide antecedent basis for at least, claim 1. Considering Figures 1 and 2, it is not immediately apparent how the connecting structure has a symmetry that substantially does not correspond to the shape of the optical element. In fact, Figure 1 shows eight supporting webs (21-28) symmetrically arranged around the circumference of the lens body 2. Figure 2 shows four webs (211-214) symmetrically arranged between lens 1 and lens mount 2. Paragraphs 27-36 of the specification provide further details regarding Figures 1 and 2. However, paragraphs 27-36 provide no support for the claim language "a connecting structure between said mount and said optical element having a symmetry characteristic that substantially does not correspond to the shape of the optical element." Applicant does not even mention "symmetrical characteristic" in paragraphs 27-36 of the specification. One of ordinary skill in the art would not be able to

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determine how in fact the symmetry of the connecting structure does not correspond to the shape of the optical element. One of ordinary skill in the art would even be more confused by paragraph 36 which includes “Any other mounting technique is likewise usable.” Due to applicant’s failure to provide sufficient supporting disclosure in the drawings and the specification, such that above claim limitation can be accurately interpreted, examiner will give above claim limitation its broadest reasonable interpretation.

A common dictionary² defines symmetry as “similarity of form or arrangement on either side of a dividing line or plane.” Furthermore, the same dictionary defines shape as “that quality of a thing which depends on the relative position of all points composing its outline or external surface, physical or spatial form.” One of ordinary skill in the art would not be able to relate “symmetry characteristic” to shape because they are completely different concepts. Shape implies the complete overall spatial dimensions of a body while “symmetry characteristic” is a single line or infinite plane about which a body has a corresponding shape or outline. It is not reasonable to equate a physical body to a line. For purposes of this examination, examiner will interpret above claim language per applicant’s disclosure if Figs 1 and 2. Nishi discloses in Fig. 2 lens holders G1 and G2 mounted circumferentially around lenses 34 and 35A. Clearly Nishi’s Figure 2 reads on Applicant’s Figure 1.

Unno discloses in column 7, lines 53-66 the following:

The temperature adjusting devices 13 and 14 are provided so as to prevent an asymmetrical temperature distribution within a lens element or elements of the projection lens 9, with respect to the optical axis thereof, which otherwise might be caused by absorption of exposure light by that lens element or elements. As a first method therefor, external heat may be applied to such a

² Webster’s New World College Dictionary, Fourth Edition

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peripheral portion of the lens element as having a lower temperature, by which the temperature distribution within the whole lens is made rotationally symmetric with respect to the optical axis. As a second method therefor, such a peripheral portion of the lens element as having a higher temperature may be cooled from the outside, by which the whole temperature distribution is made rotationally symmetric with respect to the optical 10 axis.

Unno per the above, indicates that a lens can be cooled by the structure surrounding the lens such as the support structure and the case, i.e., the lens is cooled from the outside. However, Unno is silent regarding the apparatus required to provide such cooling. Nishi discloses an apparatus that provides cooling from the outside, i.e., the lens holders G1 and G2 and the lens barrel (Figure 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the conceptual teaching of Unno with the physical disclosure of Nishi. Examiner correctly interprets the claim limitation “a connecting structure between said mount and said optical element having a symmetry characteristic that substantially does not correspond to the shape of the optical element by pointing to

Applicant Argues:

Applicant states on page 7 “The references patent to Unno is the US counterpart of EP-A 0 678 768, originally cited in the specification of the present application, paragraph [0004].

Examiner Responds:

Examiner is not persuaded. Applicant claims an earliest priority date of February 20, 1998. The Unno reference, assigned to Canon Kabushiki Kaisha was filed in the United States on April 20, 1995. The Unno reference clearly predates applicant’s earliest filing date and thus the use of the Unno reference is proper.

Applicant Argues:

Applicant states on page 7 “On page 4 of the Final Rejection the Examiner indeed notes that Unno does not disclose a mount having a symmetry characteristic that does not correspond to the shape of the optical element.”

Examiner Responds:

Examiner is not persuaded. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). For applicant's convenience, the complete rejection as provided I above office action is reproduced below:

Unno discloses above essential elements of the claimed invention as noted above but is silent regarding a connecting structure between said optical element and said mount having a symmetry characteristic that does not correspond to the shape of the optical element. Nishi discloses a connecting structure between said optical element and said mount having a symmetry characteristic that does not correspond to the shape of the optical element [Fig 2, G1, G2]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Unno to include a connecting structure between said optical element and said mount having a symmetry characteristic that does not correspond to the shape of the optical element as taught by Nishi for the purpose of securing lens elements to the lens barrel to create a projection optical system [col 11, lines 23-24 and col 11, lines 33-39].

Applicant Argues:

Applicant states on page 7 “Unno is diametrical to the idea of passive thermal compensation and hence gives no suggestion at all for a combination of Unno and Nishi as suggested in the Final Rejection.”

Examiner Responds:

Examiner is not persuaded. Applicant is directed to the title of the Nishi reference which reads “Projection exposure apparatus wherein focusing of the apparatus is changed by controlling the temperature of a lens element of the projection optical system.”

Furthermore, MPEP Section 2106 requires office personnel to give claims their broadest reasonable interpretation in light of the supporting disclosure. In *re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Claims must be interpreted in view of the specification without importing limitations from the specification into the claims. The specification of instant application does not particularly define “passive compensation” and thus examiner will give above terminology its broadest reasonable interpretation, such as natural cooling. Nishi discloses natural cooling in column 7, lines 64-66.

Furthermore, In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The Nishi reference, as can be seen from above Office Action is relied upon for details of a connecting structure between the mount and the optical element.

Applicant Argues:

Applicant states in the last paragraph on page 7 “None of the cited references addresses passive cooling of optical elements adapted to the geometry of their exposure, and hence all the claims currently on file remain novel and non-obvious.

Examiner Responds:

Examiner is not persuaded. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., passive cooling of optical elements adapted to the geometry of their exposure) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Etienne P. LeRoux whose telephone number is (571) 272-4022. The examiner can normally be reached Monday through Friday between 8:00 am and 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Safet Metjahic can be reached on (571) 272-4023. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Etienne LeRoux

11/7/2005



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